Sound Bytes/Laurie Flynn

A New Power in Publishing

Brewster Kahle

Born: Oct. 22, 1960; New York.

Education: B.S. in electrical engineering, computer science with a major in artificial intelligence, Massachusetts Institute of Technology.

Noncomputer reading: "The Autobiography of Benjamin Franklin" because "he was a printer, too."

Car: Green 1963 Volvo P-1800.

Ideal vacation: Visiting developing countries. Recently traveled in Indonesia with his wife, Mary Austin.

Family: Expecting a baby in September.

Hobby: Printing; owns an 80-year-old letterpress.

Personal Computer: Macintosh Powerbook Duo 210.

MORE than a decade ago Brewster Kahle left the relative quiet of the Massachusetts Institute of Technology's artificial intelligence laboratory to help found the Thinking Machines Corporation in Cambridge, Mass., which designs some of the world's most powerful computers.

But for Mr. Kahle (pronounced KALE), it wasn't enough to simply compute quickly; he wanted to apply supercomputing power to the problem of "information overload."

So Mr. Kahle left Thinking Machines in 1992 and set out to apply computing power to publishing. As the founder and president of WAIS Inc., which stands for Wide Area Information Servers, Mr. Kahle and his staff of a dozen workers are developing software tools to help people publish information and documents on the Internet, the global web of computer networks. As a developer of new distribution and retrieval techniques for the Internet, the company, based in Menlo Park, Calif., is in effect helping to create an electronic publishing industry.

WAIS's products include software for servers — computers that control the flow of information on networks — that lets people distribute information on the Internet. It has also developed protocols — software instructions — that enable personal computers to communicate with servers.

The first documents on the Internet using WAIS were published last summer, and the first commercial WAIS-based publications are to be available on the Internet this summer.

Question: WAIS grew out of something you were working on at Thinking Machines. How did it evolve?

Answer: At Thinking Machines, I worked on Connection machines — massively parallel computers. We made 15 gigabytes browsable — that's equivalent to 150 years of daily newspapers. The question was, how could you make this kind of power usable by people?

So I put together a consortium of four companies. Thinking Machines knew searching, Apple Computer knew all about user interface design and Dow Jones was about one-stop shopping for information. Peat Marwick was our user base of $200-an-hour people who knew the value of information.

But we found there were certain pieces that weren't being done very well by the group — the protocols and low-end servers. We founded WAIS Inc. to do just those pieces.

Q: Why does the Internet need companies like WAIS?

A: We're trying to make networks useful for more than just electronic mail and bulletin boards. We're the next wave of information technology. Most people have spent their time building the network infrastructure. Our particular piece is network publishing.

We're enabling a new publishing industry so that people can make money publishing on the Internet. This summer, through Dow Jones's Dowvision, we'll be making The Wall Street Journal and the same-day New York Times available over the network. We're also working with the Government Printing Office and the Library of Congress to publish on the network.

Q: As inventor of WAIS, how would you define it and how does it fit in with other Internet tools, like Gopher and World Wide Web?

A: What we're constructing is like a network book. Gopher is the table of contents, using hierarchical browsing; World Wide Web is hypertext pages with embedded graphics, and WAIS is the index -- it allows the user to browse and search information.

Q: What's the difference between WAIS and the traditional electronic services like Nexis and Dialog?

A: WAIS is a distributed infrastructure, a client-server system. Your machine can contact potentially many services at once. It could contact a service in Indiana at the same time as it contacts one in Hong Kong and another in California. This is different from the centralized approach of Mead and Dialog.

Q: WAIS is helping people make money distributing data in an environment where traditionally it is free. How is that going over?

A: It's very welcomed by the Internet community when it's done the Internet way. We're using open protocols, based on real standards as opposed to proprietary systems.

And you need to offer a mix of commercial and free information and software. We find if we do it that way, it's welcomed at the highest levels of the Internet community.

The dollar fell against the German mark after an economic report raised concern about U.S. inflation. [D17.]

Coffee futures prices rose in volatile trading after Brazil reported worse-than-expected damage from two freezes. [D17.]

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Affluent households will probably pick up the tab for broader health coverage. Economic Scene: Peter Passell [D2.]

The dollar's weakness against the mark is dimming the outlook on the Frankfurt Stock Exchange. Market Place. [D8.]

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Supercomputer Pioneer Seeks Investor or Buyer

A Push to Survive Amid Military Cuts

By JOHN MARKOFF

Special to The New York Times

SAN FRANCISCO, July 27 — The Thinking Machines Corporation, the company that pioneered the technology for today's fastest supercomputers only to see larger companies invade its market, is in danger of going out of business unless it can find a big investor or buyer soon.

Several industry executives said today that Thinking Machines was negotiating with both Sun Microsystems and AT&T to invest in the company or buy it outright. If the talks fail, it is unlikely that Thinking Machines will survive, said the executives, who spoke on the condition of anonymity.

Thinking Machines' president, Richard P. Fishman, declined to comment on which companies might be negotiating with the privately held supercomputer maker. But he did say the company had been looking for a partner for many months.

"We're trying to work things out under extremely difficult constraints," Mr. Fishman said. "We're pushing against the clock."

Although Thinking Machines is relatively small, with an estimated $90 million in revenues last year, it has the second-largest share of the $450 million market for a type of supercomputer known as massively parallel processing machines. But the world's largest chip maker, the Intel Corporation, is the leader in the field, and other giants like I.B.M. are also threatening to surpass Thinking Machines.

The company may be the victim of having invented a successful technology that bigger companies are better equipped to pursue. Thinking Machines is also feeling the effects of the end of the cold war, which has eroded Federal financing for supercomputer research and has curtailed the Federal Government's budget for buying such machines, which have typically sold for $10 million or more.

Founded in 1983 by a group of former Massachusetts Institute of Technology students and based in Cambridge, Mass., Thinking Machines originated the idea of massively parallel computing: chaining together tens of thousands of inexpensive microprocessor chips to reach supercomputer speeds. The tiny start-up company ultimately transformed the very top of computing world with this approach, which breaks big problems into millions of discrete elements and

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tions earlier this year. Almost immediately, Viacom set to work to sell the Garden, deeming that it would be worth more for its sale value than it

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Ball in a Str

Overcapacity and slow growth have hu
worker inspected a bottle on the glass

By BARNABY J. FEDER

Special to The New York Times

MUNCIE, Ind. — Executives at the Ball Corporation's headquarters here were as thrilled as any astronomers last December when space shuttle astronauts corrected the fuzzy vision of the Hubble space telescope. The dazzling repair in orbit used a $50 million package of special mirrors conceived and built by the company's aerospace group in Boulder, Colo.

That technical triumph gave Ball a brief respite from a long-running struggle over how to refocus itself. Overcapacity and slow growth are bedeviling the company's mainstay can and bottle businesses, and the company's hopes that it could build a highly profitable, billion-dollar aerospace business by the end of the decade have been dashed by steady contractions in space and Defense Department budgets.

One consequence has been a string of earnings disappointments that de-

went outside for top subordinates.

In recent decades, as the family's shareholdings have been spread among many heirs and fallen to about 30 percent of the outstanding shares, the chief executive's job has gone to nonfamily members, including Mr. Davis and his predecessor, Richard M. Ringeon, who spent virtually their entire careers at Ball.

Whatever Ball's problems, they have not stemmed from being hidebound or timid. The Ball family built its fortune on Mason jars widely used in home canning of fruits, and the company's can and bottle business accounted for almost 90 percent of its $2.4 billion in revenues last year.

Exotic Ventures

But family executives also led Ball into an array of more exotic ventures, from building irrigation systems in deserts to prefabricated housing to satellites. For a time in the late 1970's, the company was a leading manufacturer of video display terminals. There was also a diverse portfolio of grittier businesses, including zinc plating, plastics and rubber products, that grew out of its glass and metal container businesses.

Under Mr. Ringeon, Ball agreed in 1990 to go heavily into debt in a $1 billion deal to buy the European operations of Continental Can, only to be stymied by the unwillingness of big banks to back the deal.

Mr. Davis was no strategic wallflower either. During his tenure, Ball bought out a partner in a major glass subsidiary, bought full control of a Canadian joint venture that had fallen into bankruptcy when exposed to American competition after adoption of the United States-Canada Free Trade Agreement in 1989, and bought four other glass plants from the Kerr Glass Manufacturing Corporation.

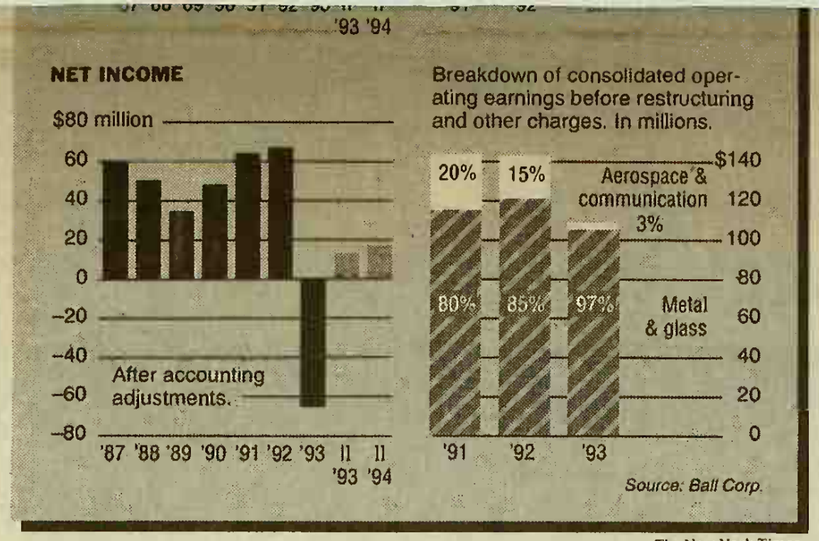
Last spring, Ball acquired Heekin Can Inc., a regional food and aerosol can maker based in Cincinnati and spun off seven small businesses into the Alltrista Corporation. Included in the spinoff was the unit that markets Ball's best-known product, the glass Mason jar used by generations of Americans for home canning. And Mr. Davis has been a strong advocate of Ball's plunge into China and other Asian markets. On Wall Street that is one of the most popular elements of its current strategy.

The International Horse

"International is the horse to carry them into the 21st century," said Eric Bosshard, who follows the company for the Roulston Research Corporation in Cleveland.

Wall Street qualms have had less to do with Ball's overall strategy than with its execution. During Mr. Davis's tenure, the company's share price fell 30 percent. In 1993, earnings came in below Wall Street's ayerage estimates every quarter. The year ended with Ball's taking a $58 million after-tax charge to cover various plant closings and layoffs and recording a full-year loss of $32.5 million on continuing operations, despite a 12 percent jump in revenues.

To be sure, Ball has suffered from external shocks, including the widespread flooding last year of vegetable farms in the Midwest and a poor salmon catch in Canada that depressed demand for food cans, as well as overcapacity in the packaging industry. Growth in demand for beverage cans, for example, averaged just 2 percent annually from 1991 through 1993, less than the rate of annual



The New York Times

tion schedules at other plants to compensate for the problems at Ruston.

Mr. Davis responded to these problems not only by closing more of the marginal operations but also by extending his search for efficiency into every nook and cranny.

For example, Ball consolidated purchasing to shave $300,000 off its annual spending for polyester straps that go around the shrink-wrapped pallets of bottles and cans it ships, according to R. David Hoover, Ball's chief financial officer. As the company examined projected paybacks from different projects, this year's capital budget was pared to $130 million from a planned $150 million.

The efforts showed signs of paying off in first-quarter earnings, reported shortly before Mr. Davis quit. The 33 cents a share was 5 cents higher than analysts' estimates. Mr. Hoover said that the company expected at least to meet Wall Street's estimates for the second quarter that ended June 30 when it reports later this month.

In commodity businesses like packaging, where every major company sells billions of bottles or cans annually, the only sure road to success is to produce nearly flawless products at a lower cost than anyone else. And Ball is on solid footing in beverage cans, analysts say, even though it lacks the overall strength of Crown Cork and Seal Inc., a far larger canning concern with huge overseas operations. They also believe the company is making progress in its other, less efficient packaging businesses.

"You only wish they'd started sooner," said Daniel Khoshaba, who follows the company for Salomon Brothers and recently raised his estimate for earnings this year by 10 cents, to $1.90 a share.

inventories. Much of the nation's strong economic growth in the second quarter seems to have gone into inventories, said Kenneth P. Mayland, the chief financial economist and senior vice president at Keycorp, a Cleveland-based bank.

The Commerce Department is scheduled to announce on Friday morning its first estimate of economic growth in the second quarter, an announcement that traders have

ble goods.

"Persistent, unsustainably low real interest rates might prompt very rapid credit growth, as expectations of price increases led households and firms to accelerate purchases of durable goods and equipment and finance these expenditures by stepping up the pace of borrowing," Mr. Greenspan said in his mention of durable goods during three hours of testimony.

Supercomputer Pioneer Seeks Investor or Buyer to Survive

Continued From First Business Page

solves them simultaneously.

The older approach to supercomputing, which is based on a small number of powerful, more expensive processors, still constitutes a larger market, estimated to surpass $1 billion this year. The leader in this field is Cray Research. But even Cray is now moving with the market toward massively parallel computers.

The technology takes advantage of the rapidly collapsing cost of off-the-shelf chips that are used in personal computers and work stations. It has changed the economics of the high-performance segment of the computer industry and is beginning to infiltrate corporate mainframe computing as well. American Express, for example, uses a Thinking Machines computer to plow through its wealth of credit-card information for detailed information about customers.

But machines for the corporate market tend to be priced much lower than the $15 million to $30 million machines that the Government was once willing to buy in computing-intensive military research programs like Star Wars.

"All the people in the world who want to buy $15 to $30 million supercomputers already have one," said Chris Willard, an analyst at the the International Data Corporation, a market research company in Framingham, Mass. "It's now a mature replacement market."

With initial funds from the Advanced Research Projects Agency of the Defense Department, the Government virtually created the market for massively parallel computers in the 1980's. Indeed, the Pentagon agency gave Thinking Machines a $12 million grant in 1989 as seed money to develop a supercomputer capable of achieving a teraflop — a trillion mathematical operations a second. But that was only a fraction of the cost that Thinking Machines and other companies said the project might cost, and no computer maker has yet achieved the goal.

Since then, the Government has seemed less interested in pursuing the teraflop goal. And Thinking Machines, which has been pursuing new avenues of support from the Government has been told that several large orders for its supercomputers are unlikely to materialize until next year.

Energy Secretary Laments Fate

Hazel R. O'Leary, Secretary of Energy, whose department helps subsidize supercomputing research, said today in a telephone interview that the demise of Thinking Machines would be unfortunate. "If we lose this jewel of a company, as a nation we are doing ourselves a disservice," she said.

Although she had no comment on financing for Thinking Machines, she did say it was in the Government's interest to support such companies. "You have to create a policy that insures that the pie is cut so there is an opportunity for both small and large companies."

But without the pressures of a cold war, industry executive said, and because supercomputing remains a field in which American industry holds a significant technical lead over the rest of the world, it is unlikely that Federal officials will be motivated to step in to save an ailing company.

Danny Hillis, Thinking Machines' co-founder and currently chief scientist, voiced frustration today that the Government had lost, since the end of the cold war, its urgency in pushing private industry to develop increasingly faster computers. "If the cold war had stopped in the middle of Apollo program," he said, "we never would have reached the moon."

But analysts say some of troubles of Thinking Machines are of its own making, citing a difficult product transition with its newest model, the CM-5, which was introduced two years ago.

Missed Opportunities

"They missed a product cycle with the CM-5," said Terry Bennett, a computer industry analyst at Infocorp, a Santa Clara, Calif, market research company. After the CM-5 came on the market, it took more than nine months for the company to add a special math processing chip to provide its full performance.

THE FRESH AIR FUND: 1877-1994

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In Supercomputers, Bigger and Faster Means Trouble

As Government spending eases, the high-end producers are foundering.

By JOHN MARKOFF

FIVE years ago the Defense Department gave $12 million to the Thinking Machines Corporation, an innovative start-up company in Cambridge, Mass. An assignment came with the seed money: take high-performance computing to new frontiers.

So Thinking Machines began a bold bid to design a new kind of computer that, by 1995, would probably cost $80 million and be more than a thousand times faster than the most powerful supercomputers available in 1989. It was a Government-subsidized effort to build the Ferrari of supercomputers. The initiative reflected Washington's high-tech policies and priorities in the late 80's, when the Cold War was still on, Star Wars spending flowed and computing firepower was considered a measure of national security.

How times have changed. Last week, the executives of Thinking Machines were shuttling across the country to talk to potential investors or buyers, in a desperate effort to avoid bankruptcy. Management mistakes and falling behind schedule in product-development plans certainly contributed to the company's fall.

But the plight of Thinking Machines also shows how much tougher the supercomputer market has become with the Government no longer spending freely and competition stiffening. Several companies in the $1.7 billion-a-year supercomputer business are struggling. The Intel Corporation's supercomputer division is losing money, and industry sources say the big chip maker may be looking to sell its business. Cray Research has seen the sales of its traditional supercomputers slip. The Maspar Computer Corporation has been kept afloat by a recent cash infusion from investors. And the Cray Computer Corporation, started five years ago by supercomputer inventor Seymour Cray after he left Cray Research, remains in business only because the founder has repeatedly dipped into his own pockets for funds.

"Supercomputing is just another victim of the end of the Cold War," said Danny Hillis, the cofounder of Thinking Machines and the company's chief scientist.

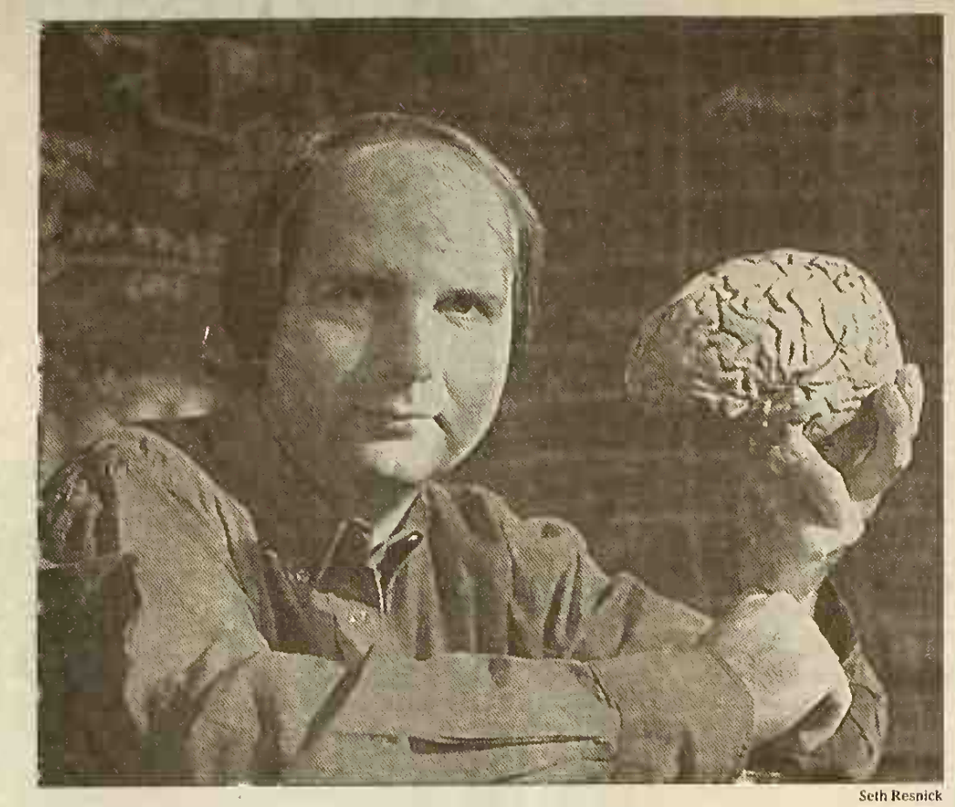
The Government programs, and Thinking Machines, did change the face of supercomputing. The company pioneered the use of so-called massively parallel design, lashing thousands of inexpensive microprocessors together to build a powerful machine. Massively parallel machines work by splitting complex scientific and mathematical equations into pieces and then solving the many parts at the same time, or in parallel.

By contrast, traditional supercomputers run on a few, costly processors and process complex equations a step at a time, or sequentially. For years, they were the workhorses for military research laboratories and were used by scientists and engineers to solve a wide variety of problems from weather prediction to molecular modeling.

But parallel machines, with their low-cost microprocessors, transformed the economics of supercomputing. Even Cray Research, leader in traditional supercomputers, has had to adopt parallel models to compete.

Still the early proponents of massively parallel processing, like Thinking Machines, have foundered as the market has shifted away from machines costing $15 million and more that the Government used to buy to far cheaper machines for the commercial market. Latecomers to parallel processing, like I.B.M. and Silicon Graphics, are doing better today by selling machines that start at $300,000 to $500,000 to research laboratories and corporate customers.

"Parallel computing has the potential to create a business segment that didn't exist before," said Irving Wladawsky-Berger, the executive who heads the International Business Machines Corporation's new effort.



Seth Resnick

Danny Hillis, cofounder of Thinking Machines, with model of a brain.

Julia Malakie for The New York Times

Richard Fishman, president, and Sheryl Handler, a cofounder, in 1993.

The companies struggling in the supercomputer field are the ones who built their business in the 80's and took their cue from Washington. In position papers and budget requests, it was an inspiring vision — ultrafast supercomputers that would greatly improve mankind's capacity to do everything from predict the weather to design miracle drugs. Celebrated as the race to a "teraflop" — jargon for computers that can calculate a trillion mathematical operations each second — the goal was like going to the moon for the makers of the world's fastest computers.

Today, it looks like a high-end, even elitist technology policy. The Clinton Administration is fond of high-tech programs. But the Administration is more interested in funding projects that will give the American public access to the so-called information highway than spending on high-performance computing efforts that will be used mainly by a relative handful of the nation's scientists.

If Washington has lost interest in subisidizing ever-faster computers, Tokyo apparently has not. A year ago, only two of the world's 20 fastest supercomputers were made in Japan. By the end of June, 10 of the top 20 were Japanese, made by NEC, Fujitsu and Hitachi. Supercomputer purists warn that giving up leadership in the supercomputer speed race could dull the nation's high-tech advantage. But to others, including some computer experts, that argument sounds like special pleading from a niche business too long dependent on Government money.

The shift in American policy has caught the makers of big, multimillion-dollar supercomputers off balance — and unable to really compete in the commercial market. Total spendiog by the Defense Department, the largest customer for big supercomputers, is slated to decline 60 percent over the next decade and that will inevitably mean buying fewer big machines, warns Anita K. Jones, director of defense research and engineering at the Pentagon.

Some industry executives say the Government is partly to blame for focusing its high-performance computing initiative narrowly on high-end machines, ignoring programs that might have been directed toward commercial markets.

"You have an industry that was built by the American taxpayer," said Howard A. Richmond, vice president for high performance computing at the Gartner Group, a consulting firm. "The Government programs should have had a little more wisdom and a little more guidance for these companies."

Supercomputer makers had hoped that they would convince corporations that the fastest computers could solve their engineering problems and save them money. For the most part, that has not happened. Like the declining market for mainframe computers, demand for big supercomputers is shrinking, by more than 9 percent annually the past five years, according to the International Data Corporation, a market research firm.

"There's no commercial market at the high-end of the supercomputer business," said Larry Smarr, director of the National Center for Supercomputer Applications, in Urbana, Ill.

One big obstacle to reaching the commercial market has been designing software for massively parallel computers, which has proved more difficult than the industry pioneers had hoped. Breaking big problems into little pieces may open the way to use low-cost microprocessors as hardware, but it created a programming nightmare, particularly in the commercial market, where the variety of business applications is enormous.

"The road to programming massively parallel computers is littered with the bodies of graduate students," said Steve Steinberg, a computer science graduate student at the University of California at Berkeley.

Still, the sales of smaller, less costly parallel computing machines are growing rapidly. Both research labs and companies want the advantages of the technology, but they do not want the huge pricetags and software headaches that go with the biggest massively parallel versions. American Express, Walmart and other large corporations use parallel computers to mine customer records for market trends, and smaller companies want to follow their lead.

And the increasingly powerful microprocessors are allowing more modest versions of parallel computing — like machines that use so-called symmetric multiprocessing and workstations linked together — to do chores that once could be handled only by the biggest supercomputers. High-performance computers are generally considered to be ones that can achieve speeds of 100 megaflops or more — or 100 million mathematical operations a second. Today, a personal computer with Intel's Pentium microchip can reach speeds of 16 megaflops or more.

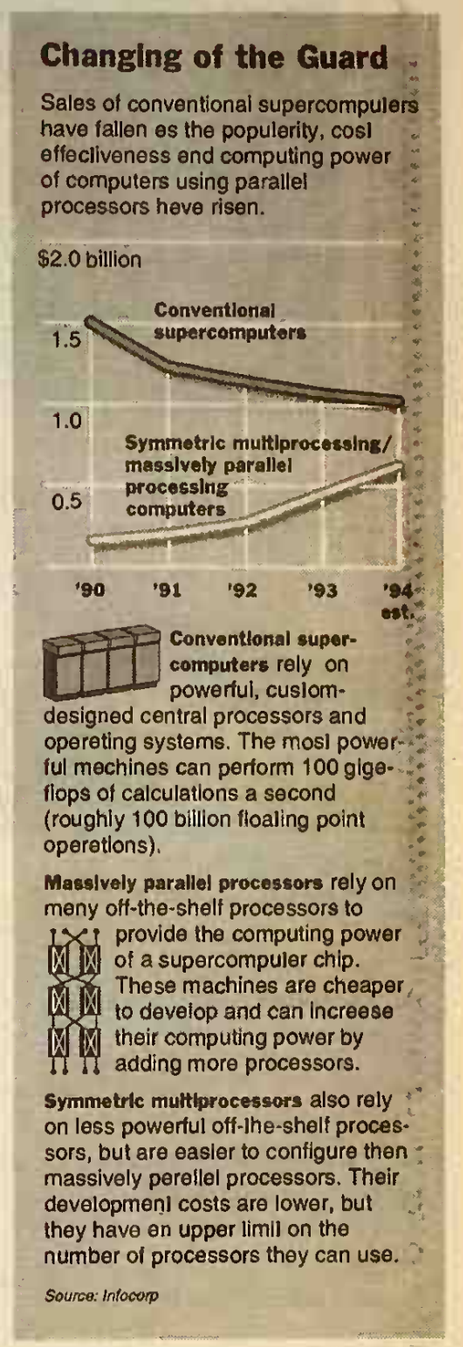
"One computer center after the other is lining up to put a cluster of microprocessors on the floor," said Eugene Brooks, a scientist at Lawrence Livermore National Laboratories in Livermore, Calif. "Their budgets are shrinking and these systems are much more cost effective."

The relentless advance of small-scale computing, which is dominated by big companies, at the expense of the supercomputer makers, traditionally the province of small specialists, shows no signs of letting up.

"This is the end of an era," said Nathan Myhrvold, vice president for advanced technology at the Microsoft Corporation, the largest software maker. "Huge computing problems are not going away, but it's tough to see how any supercomputer company is going to survive in the long-term."

Microsoft, in fact, is aiming for one market that supercomputer makers are hoping will be a promising new business for them.

Earlier this year, Microsoft announced its program called Tiger, intended to permit groups of microprocessor-based desktop machines to operate as video servers. If successful, the Tiger software will sharply reduce the cost of computers needed to run the video servers that will deliver movies-on-demand to American households before long.


Changing of the Guard
Sales of conventional supercompulers have fallen es the popularity, cosl effecliveness end computing power of computers using parallel processors heve risen.
$2.0 billion
1.5
1.0
0.5
Conventional supercomputers
Symmetric multiprocessing/ massively parallel processing computers
'90
'91
'92
'93
'94 est.
Conventional supercomputers rely on powerful, custom-designed central processors and opereting systems. The mosl powerful mechines can perform 100 gigeflops of calculations a second (roughly 100 billion floaling point operetions).
Massively parallel processors rely on meny off-the-shelf processors to provide the computing power of a supercompuler chip. These machines are cheaper to develop and can increese their computing power by adding more processors.
Symmetric multiprocessors also rely on less powerful off-lhe-shelf procesors, but are easier to configure then massively perellel processors. Their developmenl costs are lower, but they have en upper limil on the number of processors they can use.
Source: Infocorp

The New York Times

With the market moving away from its big, costly computers, Thinking Machines has increasingly looked like an endangered species. In 1992, after a General Accounting Office study criticized its funding practices, the Pentagon's Advanced Projects Research Agency froze its spending on large massively parallel machines. Some money was eventually freed, but the shift was a setback for Thinking Machines.

The private company's sales fell from $92 million in 1992 to $83 million last year, while losses mounted from $17 million to $20 million. The company went through a management shake-up last fall when its cofounder Sheryl Handler stepped down as president; she left the company altogether last April. Richard Fishman, a corporate lawyer who became the company's president last year, acknowledges that Thinking Machines was slow to face up to its problems, adjust its strategy and go after the mainstream of the high-performance computing market.

"We didn't do what we should have done," he said. "There was a view that our technology was so superior that no one could challenge us. We were wrong."

For Mr. Hillis, the cofounder of Thinking Machines, the experience has proven to be a painful one, but not without rewards.

"The nation set a goal that was clear and specific and now they've changed the goal and we're left having made the investment," he said.

The technology the company pioneered has become an accepted standard in all segments of the computing industry.

"We may die, but we didn't fail," he said. ■

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The New York Times
Business

Sunday, May 8, 1994
Section 3

MARKET WATCH

Floyd Norris

Perversely, Higher Rates Hurt The Dollar

THE United States Government went on the record last week, firmly declaring it was against a collapse of the dollar. Supported by unified central bank intervention, the lowly buck rallied a bit.

That it was necessary — and newsworthy — for Lloyd Bentsen, the Treasury Secretary, to say nice things about the dollar is another indication just how confused things have become. Mr. Bentsen had once indicated he would welcome a weaker dollar, and it had not been clear that his opinion had changed.

The Dow Drops 12.19 to 3,669.50

The Clinton Administration's foreign economic policies, like its other foreign policies, too often seem reminiscent of the old line about New England weather: if you don't like it, wait five minutes and it will change. Whether on Haiti or trade with China, the impression that is left is of a vacillating Administration unsure of which of its conflicting goals is more important but sensitive to any indication of public opinion.

But in this case it is easy to understand the Administration's hurried decision to intervene to support the dollar. When a patient is given the prescribed remedy and proceeds to get a lot worse, it is clearly time for desperate action. And at least the Fed's first intervention, on April 29, came before Wall Street was clamoring for action.

The bad medicine in this case was the Fed's decision to raise interest rates. In normal times that ought to help the dollar by attracting foreign funds.

In this case, though, the opposite happened. From the Fed's first tightening to its decision to buy bucks, the rate on six-month Treasury bills rose more than a full percentage point. At the same time, the similar German rate fell a quarter point. And the dollar lost 6 percent of its value against the mark.

As Rates Went Up ...

That perverse reaction is another indication of the truly massive speculation that had been going on regarding American interest rates. No one knows just how large, or how leveraged, were all the bets on the bond bull market. In some cases, like Procter & Gamble's misadventure with interest rate swaps, it appears that even the gamblers did not understand how big their bet was.

Those bets are now being unwound. Rising interest rates are a reason to get out of the bond market, and, with American short-term rates still under European ones, there is a temptation for those abandoning Treasury bonds to get out of dollars as well.

The unwinding of that speculation helps to explain why everything can fall at the same time, as happened Friday when a surprisingly strong employment report sent bonds plunging — pushing the yield on 30-year Treasury bonds above 7.5 percent for the first time in the Clinton Administration — while both stocks and the dollar suffered along with it.

... The Dollar Went Down

None of that has much to do with economic fundamentals, which is one reason why intervention in foreign exchange markets is easier to justify now than at other times. But simply because there was so much speculation on ever-declining interest rates, it is hard to tell how long the perverse effects of unwinding that speculation will last.

Nawm Kazhdan with Jack Taromina/The New York Times

The PC, surprising companies that bet on interactive TV.

By JOHN MARKOFF

Forget TV. It's the computer that will bring news, games, shopping and other services into the home.

TO know Dana Law is to know that the future of television may be a lot gloomier than powerful cable-industry figures like John Malone and Gerald Levin have been saying. And that the future of the personal computer industry may be a lot brighter.

Mr. Law, 40, who makes his living as a magician and a psychic, spends a lot of time in front of the tube in his house in El Cajon, near San Diego. He gets the latest news and weather, sends and receives electronic mail, shops and checks travel guides to find out where to eat out.

But Mr. Law's tube is not a television. It's a computer, hooked to the local cable system. "It runs like the wind now," he said. "It's amazing what's available. And I'm getting sound and pictures that I wasn't getting before."

A few years ago Mr. Law might have seemed unusual. Now, however, there are millions of Americans like him, and the number is growing fast. They are people who can operate their personal computer as effortlessly as they can drive a car, who are as comfortable with a computer as with a television set. And they are people who would rather spend their time in front of a PC than a TV.

Such people are giving pause to the big-name companies in a variety of industries that have gambled with much fanfare that it is the television, not the personal computer, that will be the portal to the many "interactive" services already here or on the horizon. Among those services are home shopping, video games that can be played with someone elsewhere, electronic mail, video conferencing, and news and information retrieval.

These companies, including Time Warner, Tele-Communications Inc., AT&T, Viacom, US West and Bell Atlantic, have invested a lot of money and credibility in dozens of field tests of interactive television in places like Queens, N.Y., Orlando, Fla., and Alexandria, Va. Now, almost overnight, they are realizing that the personal computer may be the place to be.

"For interactive applications the personal computer is going to win," said Nicholas Negroponte, director of the Media Laboratory at the Massachusetts Institute of Technology, which receives financing from both the personal-computer and television industries.

The argument of the companies betting on television as the best way into the American home is simple: Almost everyone has a TV, and almost everyone is far more comfortable using a TV than a PC. Sounds like the argument buggy makers made after the Model T was introduced 85 years ago.

But just as improvements on the automobile made it far more appealing and affordable, advances on the personal computer are making it much easier to operate, much more useful and much less expensive. For example, the newest generation of personal computers have chips powerful enough to run video with the resolution and lack of jerkiness of a television picture.

So ubiquitous and familiar will the personal computer become, particularly among younger Americans, that it will soon be the most indispensable tool in the information age, says the economist George Gilder. As a result, many communications, computer and entertainment companies are reversing course and scrambling to invest in interactive services that can be used on the personal computer instead of — or at least as well as — on the television.

For example, Tele-Communications, the largest cable operator, has joined with Microsoft, the largest software company, to test software that allows a personal computer access to data bases over TCI's cable network.

Viacom, the cable and entertainment giant, is developing multimedia games and educational programs that will blend the interactivity of a CD-ROM with the format of an MTV or a Nickelodeon. For example, personal computer users might someday tap into the cable network to receive video games on a pay-per-use or subscription basis, or tune in to interactive television programs that permit the viewer to take the role of one character and change the outcome as the show progresses. And in its Castro Valley, Calif., trial of interactive services, Viacom now plans to experiment not only with television but also with the personal computer.

These companies are joining many computer, software and information companies that have already recognized the potential of the PC for interactive services and are rushing to capitalize on it. Later this year Microsoft plans to release a new version of its Windows operating system that will simplify the process of connecting personal computers to cable and telephone networks. The Intel Corporation plans to introduce next month a modem that hooks a personal computer to cable-television lines and allows PC users to receive information from the cable network more than 2,000 times faster than through a conventional telephone modem. And in San Diego, Prodigy, the nation's largest on-line computer service, has tapped into the high-capacity local cable lines, allowing it to offer customers like Mr. Law not only text but sound, pictures and, soon, video.

Now that personal computers can offer video of television quality, many software publishers expect to announce entertainment and educational products to be delivered over cable networks and phone lines to PC users. Microsoft is developing interactive programs including ones that allow home banking and the gathering of sports statistics. And early next year, Prodigy, in cooperation with the ESPN cable network, plans to offer its users video clips of sports highlights.

For investors, the implications are obvious. Personal computer makers like I.B.M., Compaq and Apple all stand to gain, as do chip makers like Intel and Motorola and software companies offering educational or entertainment programs, like Microsoft, Broderbund and Electronic Arts. Companies with a big stake in developing the devices for interactive television, including Silicon Graphics, General Instrument and Scientific-Atlanta, stand to lose. And other companies that committed money and time to experiments in interactive television stand to be embarrassed.

The advantage enjoyed by the personal computer

Continued on Page 8

INSIDE

Biotechnology

Genentech's On a Roll Again, At Least for Now

After setbacks with its flagship drug, Genentech, the world's first biotech company, was so weakened that Roche Holdings acquired majority ownership in 1990. With Roche's financial help, Genentech got back on track and now has multiple products and healthy profits, a rare combination in the industry. But it remains small, and the cloud hanging over it is whether Roche will exercise its option to acquire the balance of the company. By Lawrence M. Fisher.

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The DNA double helix.

International

Remaking India's Economy

Since 1991, Manmohan Singh has been the principal architect of market-based reforms aimed at pulling India's economy from decades of stagnation. He has cut taxes, tariffs and restrictions on foreign investment. Next week, his efforts will get a fresh airing in front of American audiences when Prime Minister P. V. Narasimha Rao visits the United States for the first time since he took office three years ago. By John F. Burns.

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Technology

Music in an Interactive Key

Major record companies are looking for ways to integrate the sights and sounds of music videos with the user interaction of personal computers — MTV meets the PC. Already, there are more than a dozen interactive recorded music titles on the market. One allows the user to change the tempo, pitch and sequence of 1,500 musical segments. By Charles Bermant.

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The New York Times

Manmohan Singh, India's Finance Minister.

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Potent PC Surprises Those Betting on Interactive TV

Continued from Page 1

over the television may not last beyond the next few years, however. There is much debate about what the "home information appliance" will look like a decade from now. One view — call it the Ronco Dicer Slicer Approach — is that a single device combining all the attributes of a computer and a television will emerge. It will have a high-definition screen and a controller that is a cross between a remote-control wand and a keyboard.

But there is an increasingly accepted school of thought that there will someday be not one but many devices in the home. Like kitchen appliances today, information appliances a decade from now will each have a different function. The personal computer and the TV will both be so affordable that the average family will think nothing of having one or more of each, as well as other information appliances, like smart telephones.

But for now, at least, it is the personal computer, not the television, that is becoming an increasingly powerful magnet.

The TV Vision

The vision of interactive television, as espoused by executives like Mr. Malone of Tele-Communications Inc. and Mr. Levin of Time Warner, is of a futuristic version of the cable-converter box atop the family TV. It would bring into the home an avalanche of new services — any movie, any time; video games that would allow many players in many places; home shopping and banking; electronic mail and information services. It would be easily operated even by the technically unsophisticated by means of a simple wand that could act like an existing remote-control device or like a personal- computer mouse.

Everything from the box atop the TV, known as a set-top controller, to giant computers that would distribute the services over the cable network has had to be designed, and is now being tested in various communities.

Among the most passionate defenders of this vision are executives at Time Warner, which has tested such a system in Queens and plans another test for Orlando, Fla., starting this fall, and at Silicon Graphics Inc., which is designing the set-top controller for Time Warner. They argue that entertainment viewed on the television, not other services offered on the personal computer, will be the driving force that brings interactivity to most Americans.

"How many American homes even have a den for the personal computer?" said Ed McCracken, chairman of Silicon Graphics. "At a personal computer you sit there and do things and the computer reacts. In the entertainment world the television does things and you react to it. This is going to be about entertainment."

The PC Vision

But now this vision is being challenged by the growing realization that desktop computers and their networks are no longer the realm of scientists and hobbyists. More than 5 million people in this country will be subscribing to commercial on-line services by the end of the year, up from 3.9 million last year, according to Jupiter Communications, a New York market-research firm.

The Internet, the network that connects on-line services as well as students, scientists and Government employees, is growing even more quickly, and now counts 20 million computers worldwide — roughly the number of homes viewing last week's most popular TV show, "Seinfeld."

Executives at Intel point out that almost 30 percent of the nation's homes already have personal computers, a figure that will rise to well above 50 percent by the end of the decade. And 52 percent of the homes with incomes between $50,000 and $100,000 a year have PC's, as well as 65 percent of homes above $100,000, according to Link Resources, a market-research firm in New York.

Even computer industry executives say they have been surprised by how rapidly the personal computer is being adopted in the home. "We in the computer industry thought our business was in corporations," said Avram Miller, vice president for business development at Intel. He said that last year 45 percent of the personal computers with Intel chips were shipped to homes rather than businesses and that revenue from the sale of personal computers surpassed that from color televisions in the United States.

Also favoring the personal computer is the advantage it currently enjoys over the television in what it can offer. Most of the services envisioned for interactive television, like home shopping and information retrieval, are already available over the personal computer from on-line services like Prodigy, Compuserve and America On-Line. And they are becoming easier to use, thanks to the addition of point-and-click controllers and improvements in on-screen graphics.

The computer has other advantages, too. It has a display screen that offers higher resolution than the television screen, which has been locked into the same resolution for more than five decades and is unlikely to change before the end of the century. This means that the personal computer can produce higher-quality video.

Also, the computer is easier to read on than a television. People are generally about 18 inches from their computer screens, as opposed to 9 feet from a TV. Many interactive services require a lot of reading.

Those differences mean that, while the television holds the advantage for watching programs and movies as a family, the personal computer is better for just about everything else.

The Price Factor

Interactive television may have another Achilles heel — cost. In its trial in Orlando, Time Warner will use a set-top box that costs the company $5,000 apiece. For a similar trial in Castro Valley scheduled by Viacom, AT&T's Bell Laboratories has developed a box that will cost $4,000 apiece.

By contrast, the main cost of connecting a personal computer to the local cable or phone system is a special modem. Companies including Zenith that sell this device are charging about $400. But that price will soon come down to around $100, about the cost of a conventional modem, said Scott Kurnit, an executive vice president at Prodigy.

The cable companies say that the trials are strictly to demonstrate the feasibility of interactive television and that set-top controllers will fall rapidly in price before they hit the market, making them affordable to the average cable customer within three years.

But many critics of interactive television doubt that the price will drop so quickly.

These critics also question whether interactive television can be financed by revenues from the sale of movies, which is what its proponents are counting on to finance the construction of more sophisticated systems that offer more services. "Everyone is talking about video-on-demand as the 'killer app' for interactive television," said Robert Alexander, a New York consultant, "but I don't think that stands up."

Mr. Alexander estimated that it would cost $100 billion to deploy an advanced electronic network to most American homes. That works out to about $1,000 per home, although even that number will seem optimistic at least until 1996 or 1997.

He then assumed that the price per movie in the interactive television trials would be $1 to $4, generating an hourly rate of 50 cents to $2 per hour, of which the cable operator would clear 25 cents to $1.

Then he estimated that the cable industry would require a 15 to 20 percent return on its investment. If that is true, it would require $20 billion in revenue, equal to 20 to 80 billion hours of movies on demand.

If the figure were 50 billion hours, that would work out to about 500 hours per household — 10 hours per week, or 5 movies a week for every household in the country.

"It's not disloyal to say that this kind of activity is simply not in the cards," Mr. Alexander said. "Something besides movies-on-demand will have to pay for the new networks."

Cable Disappointments

The new openness toward the personal computer can also be attributed to the collapse of some big mergers between cable and telephone companies that shared a vision of interactive television. Among those broken deals: the TCI-Bell Atlantic merger, and the Cox Enterprises-Southwestern Bell combination.

"As a result of the failure of the mergers, people who have content are looking to the 'den' solution rather than the 'living room' solution," said Mitchell Kapor, the software developer, referring to the den as the room where the PC is often found.

One more reason that prospects for the personal computer are brighter is that the cable industry has been slowing its investment in the modernization of its networks, an upgrade that is more necessary for interactive television than for interactive personal computing. Last week, for example, Time Warner said it would cut capital investment by $100 million. Tele-Communications said in February that it would delay $500 million in new spending until the Government clarified its regulatory position.

The disadvantages of interactive TV have led to a new willingness among many companies to consider the computer. "If we have customers using PC's we intend to serve them," said Robert Thompson, senior vice president at Tele-Communications.

This new awareness shows in many recent industry moves.

In recent months Tele-Communications has drawn nearer to Microsoft, a company with a "PC-centric" view of the world. The two companies, which last year came close to creating a company with others including Time Warner that would produce software for the set-top controller, are now jointly exploring Microsoft's technology for both personal computing and interactive television.

And now that the Pentium chip from Intel and the Power PC chip from I.B.M., Motorola and Apple allow personal computers to run television-quality video, a number of companies are planning to bring out entertaining or educational software that offers sound and video.

For example, 20th Television, a subsidiary of Rupert Murdoch's Fox Inc., recently dispatched a top executive, Matt Jacobson, to lead an effort to develop interactive programming for Delphi, the parent company's online personal computer service, which Mr. Murdoch bought last year.

Prodigy has taken a particularly strong interest in linking the personal computer to cable systems. In the company's trial in San Diego, subscribers who link their PC's to a cable system can get Prodigy almost 70 times faster than it comes into their homes by a telephone modem. Combined with the more powerful personal computers available, this means that Prodigy customers can now receive sound and video.

Prodigy recently decided to introduce the cable connection commercially. Before the end of the year it will be available in 12 cities. (The company wouldn't name them.)

Other Ventures

Entrepreneurs are also leaping toward interactive services over the computer. For exampte, last year Carl Malamud, a Washington computer network expert, introduced Internet Talk Radio. Each week, with the sponsorship of computer and software companies, Mr. Malamud broadcasts a half-hour radio show. People who use powerful computer work stations can listen to Mr. Malamud's program, which includes news and interviews from the computer industry and which is broadcast "digitally" as ones and zeroes over a computer network and then converted to sound on the computer.

Last week Mr. Malamud went a step farther and added video that can be viewed on computer work stations tapping into the Internet. "The future isn't 500 channels coming out of cable TV," he said. "It's going to be a personal computer that will be used in ways the cable companies never thought of."

At least one television personality has also jumped from television to personal computing. Adam Curry, a "video jock" on Viacom's MTV channel, established an address on the Internet last year that offers a newsletter, music and videos.

Last month Mr. Curry left MTV to devote himself entirely to the new personal computer medium. In a letter announcing his resignation last week he said that the Internet "is surpassing all traditional media, with its ever increasing global audience; the power is unlimited, and it's in the hands of the people, finally!" ■

Sizing Up the Competing Platforms

Making grand visions of interactive communication into real products and services turns on whether the consumer will use a television set or home computer. Here are some strengths and weaknesses of each.

	THE TELEVISION AND SET-TOP BOX APPROACH	THE PERSONAL COMPUTER APPROACH	SIGNIFICANCE
THE DISPLAY	The standard television display, a low-resolution video image, has not changed in many years. TV is well adapted to showing full-motion video to viewers sitting several feet away, but text display is extremely limited. High-definition tatavision, still getting off the ground, is sharper but still poor for text.	Computer displays, which are essentially improved television tubes, have evolved to the point where the latest high-resolution models easily display video, text and graphics crisply to a viewer seated a foot and a half away. Displays suitable for a roomful of people are less advanced.	Computers won't have to adapt much to match television's strengths, but televisions are a long way from matching computer monitors' strengths.
THE CONTROLS	A hand-held remote control that permits selections from menus; possibly a joystick, trackball or other handheld cursor control borrowed from video games.	A full-function keyboard; most also have a mouse for pointing, clicking and highlighting; other devices like joysticks, trackballs, light pens and voice recognition systems are widely available.	There are far more flexible and powerful ways to interact with a computer than a television.
THE PIPELINE	Existing cable television systems can deliver a huge amount of information rapidly one way—to the home—but must be modified to allow a significant return flow.	Computers traditionally talk to each other over phone lines, which have sharply limited capacity compared with cable. But new modems and networks let them communicate over high-capacity cable lines.	Whichever system is ultimately dominant will need high-capacity lines to deliver the vast volume of data needed for digitized video like movies-on-demand.
THE BRAINS	The set-top box is really a special-purpose computer with powerful graphics and communications features but limited versatility: users can do nothing else with it. The box is largely a sleve to the central computers of the interactive system.	Home computers are very versatile; interactive applications are only a small part of what they can do. They are powerful in their own right and not dependant on the system's central computers with which they communicate.	In the history of new technologies, single-use hardware has usually lost out to more versatile hardware, and centralized control has usually given way to autonomy for users.
ACCESSIBILITY	Nearly every household has a television and is familiar and comfortable with using it. Video games, the closest analogue to the set-top box's interface with the user, are commonplace and more than half of all households receive cable service.	Personal computers are rapidly gaining acceptance in the home and are selling briskly, especially those that are easiest and most comfortable to use. The people most likely to use interactive systems may be the same ones most attracted to computers.	The leap to interactive use is greater from passive television watching than from active computer use, so the "universality" of television is less an advantage than it appears. But an important part of the public remains uncomfortable with computers.

Interactivity on Trial

Major tests of interactive networks.

TELEVISION TRIALS

Alexandria, Va.

Bell Atlantic

Interactive television to be delivered over phone lines using new transmission technology.

Castro Valley, Calif.

Viacom, AT&T

Movies-on-demand and home shopping, plus a PC option.

Denver

TCI, AT&T, US West

Tested market response to movies-on-demand, home banking and shopping, and phone services over cable.

Two trials in Omaha

Cox Cable

Rebuilding a cable system with fiber optic cable. Movies-on-demand will come first; music videos, arcade games, interactive multimedia guides, electronic classifieds, home shopping later.

US West, 3DO

Movies, telephone services and interactive games via phone lines.

Orlando, Fla.

Time Warner, Silicon Graphics, Scientific Atlanta

Full-scale trial to include movies-on-demand, home shopping and video games.

Queens

Time Warner

Low-profile test of movies-on-demand over cable begun in December 1991.

PERSONAL COMPUTER AND CABLE TRIALS

Cambridge, Mass.

Continental Cablevision, Performance Systems

Users connect to the Internet over the cable system.

Castro Valley, Calif.

Intel, Viacom, AT&T

Video programming to be delivered to PC users via cable at speeds hundreds of times faster than current telephone-line computer links.

Cupertino, Calif.

TCI, Hybrid Communications

Cable delivery of Internet access to households in Cupertino, San Jose and San Francisco, as part of a consortium creating an advanced PC network for Silicon Valley.

Exeter, N.H.

Compuserve, Continental Cablevision, Teleport

On-line information via cable.

San Diego

Prodigy, Cox Cable

On-line information via cable. Service in 12 more cities planned.

Seattle

Microsoft, TCI

Test planned of software developed by Microsoft that allows access to data bases over TCI's cable network.

Niagara Asset Corporation
Loan Sale Announcement

Performing and Nonperforming Residential Loans

Niagara Asset Corporation, a Servicer for the FDIC, as Receiver for Goldome, intends to offer Loan Package #00314 for sale through a Sealed Bid process.

Poole	No. of Loans	Approximate Principal Balance	Bid Due Date
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Non-Performing	43	$2.4MM	June 1, 1994

Properties concentrated in NY and FL
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Individual Package Bids Only

For details regarding this bid package,
Contact: **David Mercer, Vice President,**
Niagara Asset Corporation, Waterfront Village Center
60 Lakefront Boulevard - Suite 316,
Buffalo, New York 14202-4392
Telephone: (800) 846-6164, Fax (716) 847-4887

This advertisement is neither an offer to sell, nor a solicitation of an offer to buy any of these loans. Sale of these loans shall only be made to sophisticated purchasers who have sufficient knowledge and experience in financial and business matters and are capable of evaluating and absorbing the risk of an investment in these loans.

SALE OF ASSETS

UNITED STATES BANKRUPTCY COURT
FOR THE DISTRICT OF NEW JERSEY

In re:
RAGEN CORPORATION, a New Jersey Corporation
Debtor
(Hon. Stephen A. Stripp)
Chapter 11
Case No. 93-37885

NOTICE OF HEARING AND OF TERMS AND CONDITIONS OF SALE OF ASSETS

Notice is hereby given that on the 24th day of May, 1994 at 3:00 p.m., a hearing will be held before the Honorable Stephen A. Stripp at the United States Bankruptcy Court, 402 East State Street, Trenton, New Jersey at 9:00 a.m. ("Hearing"), for an order authorizing the Debtor to sell substantially all of the operating assets of Debtor to Industrial Acquisition Corp. ("IAC") pursuant to a Stock Purchase Agreement ("Agreement") or to any such person who submits a higher or better bid, which bid is approved by the Court at the Hearing. A copy of the Motion, with the Agreement appended, is on file with the Clerk of the Bankruptcy Court and may be reviewed during the Court's regular business hours. Copies may also be obtained upon payment of the copying costs by contacting Crummy, Del Deo, Dolan, Griffinger & Vecchione, One Riverfront Plaza, Newark, New Jersey 07102 counsel for Debtor, Contact: Michael J. Lerner, Esq. (201) 596-4500

ASSETS TO BE SOLD

Pursuant to the Agreement, the assets of the Debtor to be sold include 100% of the stock owned by the Debtor in Ragen Systems, Inc. ("RSI") and Industrial Metalworking Services, Inc. ("IMS") ("Assets to be Sold"). Assets excluded from the sale include: cash, refunds or other payments due Debtor, claims of the Debtor arising under the Bankruptcy Code and any other assets of the Debtor including machinery and equipment, vehicles, marketable securities and receivables (excluding intercompany receivables)

TERMS OF SALE

Unless a higher and better offer is received at the Hearing, the Debtor intends to sell the Assets to be Sold to IAC for total consideration of $2,577,000.00 consisting of cash in the amount of $150,000, an assumption of secured debt of approximately $1,227,000 and an assumption of the liabilities of RSI and IMS of $1,150,000.00.

HIGHER AND BETTER OFFERS

Any person or entity interested in purchasing the Assets to be Sold may place a competing bid for those assets, provided, however, that (i) the first bid must be for an amount at least $50,000.00 in excess of the value of the consideration for the purchase of the Assets to be Sold set forth in the Agreement and provide for payment of the secured debt in full in cash on the closing date; (ii) shall not be contingent upon the receipt of the financing necessary to its consummation; (iii) shall not be conditioned on the outcome of unperformed due diligence; (iv) shall be accompanied by a deposit of $25,000.00; (v) shall be on terms which are no more burdensome to the Seller or more conditional in any material respect than the terms of the Agreement; and (vi) shall be submitted with evidence of financial ability to conclude the transaction without delay.

Any party seeking to submit a competing bid must file that Competing Bid in writing with the Clerk of the Bankruptcy Court at 402 E. State Street, Trenton, N.J. 08608 on or before 12:00 p.m. on May 23, 1994 and serve a copy of said Competing Bid by Federal Express or its equivalent upon:

(1) Crummy, Del Deo, Dolan, Griffinger & Vecchione
Counsel to Debtor
One Riverfront Plaza
Newark, New Jersey 07102-5497
Attn: Michael J. Lerner, Esq.
(2) Fitzsimmons, Ringis & Jacobs, PC
50 Park Place
Newark, New Jersey 07901
Attn: Frank Fitzsimmons, Esq.
(3) Lowenstein Sandler Kohl Fisher & Boylan
65 Livingston Avenue
Roseland, NJ 07068
Attn: William S. Katchen, Esq.
(4) Ravin, Sarasohn, Cook, Baumgarten, Fisch & Baime
Counsel to Creditors' Committee
103 Eisenhower Parkway
Roseland, New Jersey 07068
Attn: Kenneth A. Rosen, Esq.
(5) United States Trustee
60 Park Place, Suite 210
Newark, New Jersey 07102
(6) Securities and Exchange Commission
450 Fifth Street, N.W.
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